

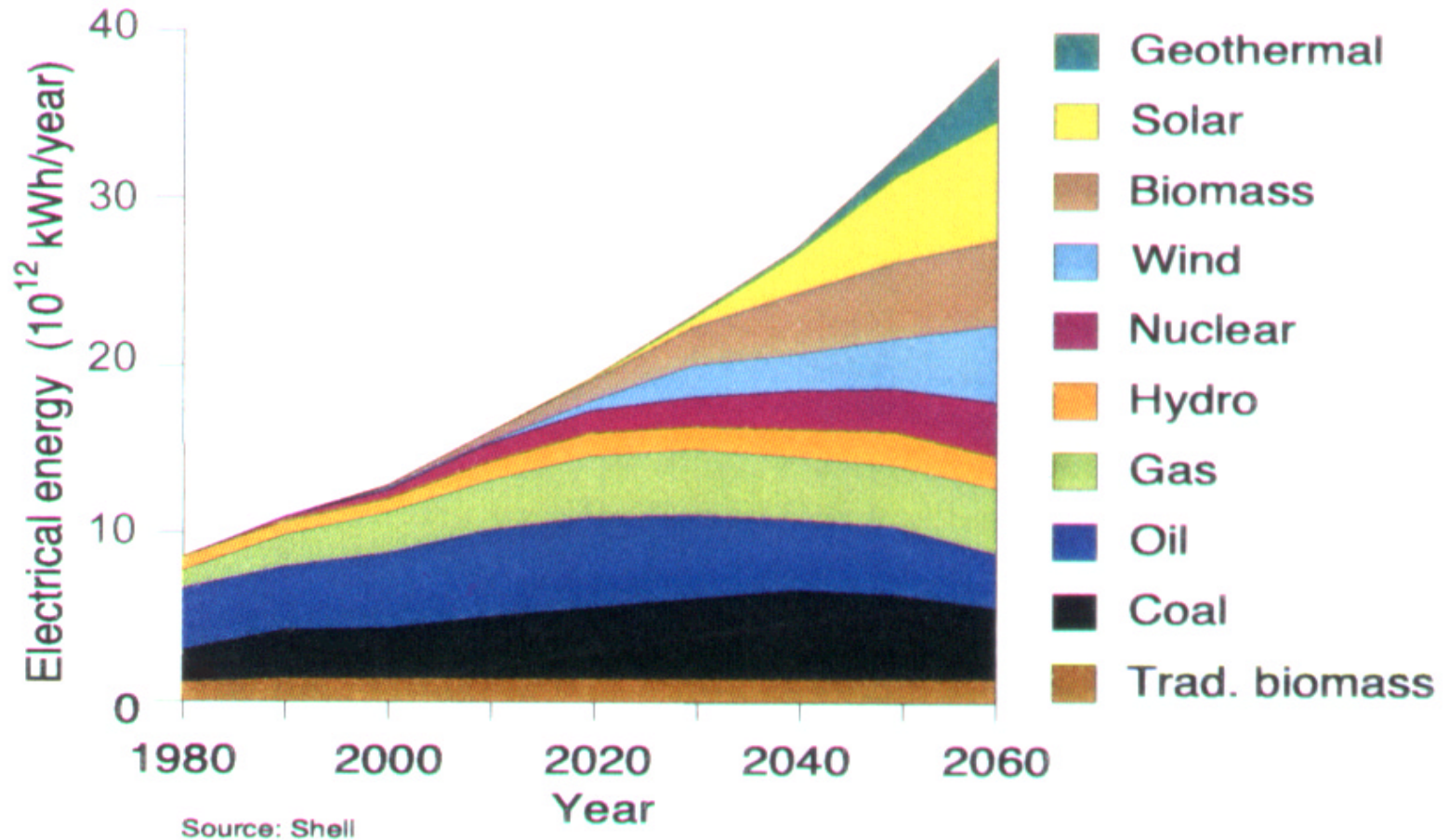


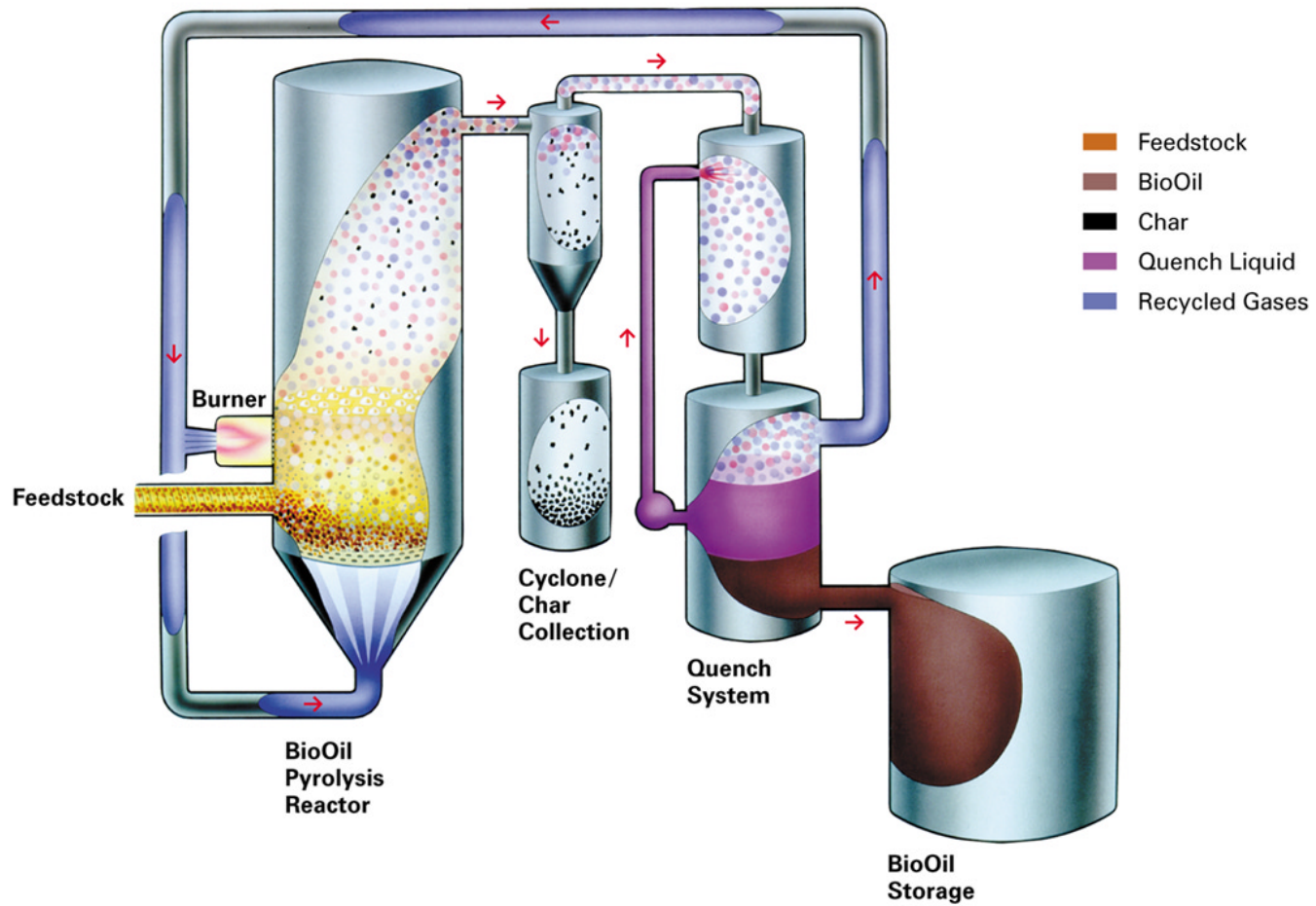
DynaMotive Energy Systems

Presentation to

***CONEG / NRBP / USFS
and Others***

***Concord, New Hampshire
August 16, 2002***





- Low Capital and Operating Cost
 - High BioOil Quality
 - High BioOil Yield
 - Low Scale Up Risk
 - Feedstock Flexibility
 - Waste Free Process
-

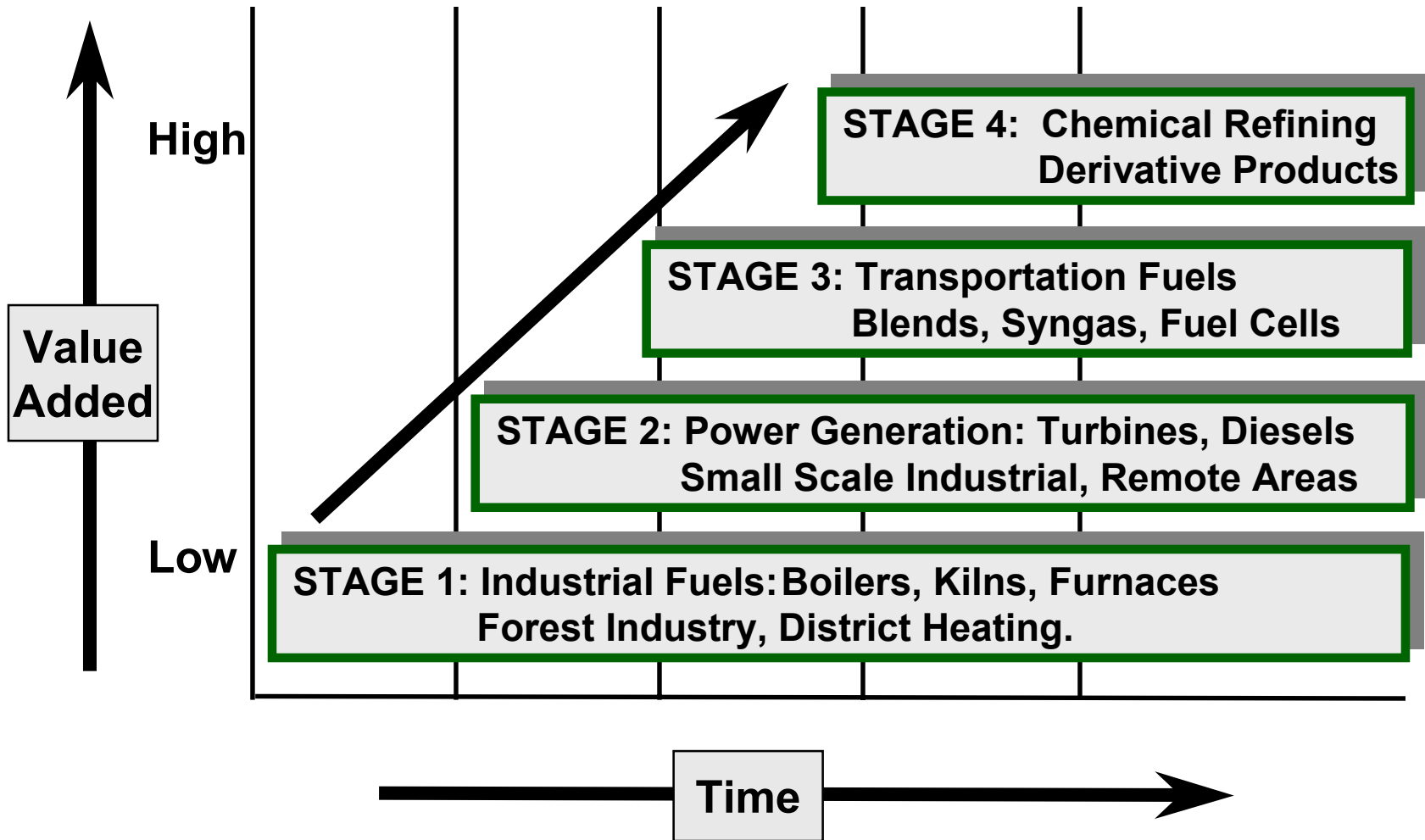
- Considered CO₂ / GHG neutral
 - No SO_x emissions
 - Low NO_x emissions
 - Accessible and abundant renewable reserves
 - Local production from biomass residue/waste
-

Production:

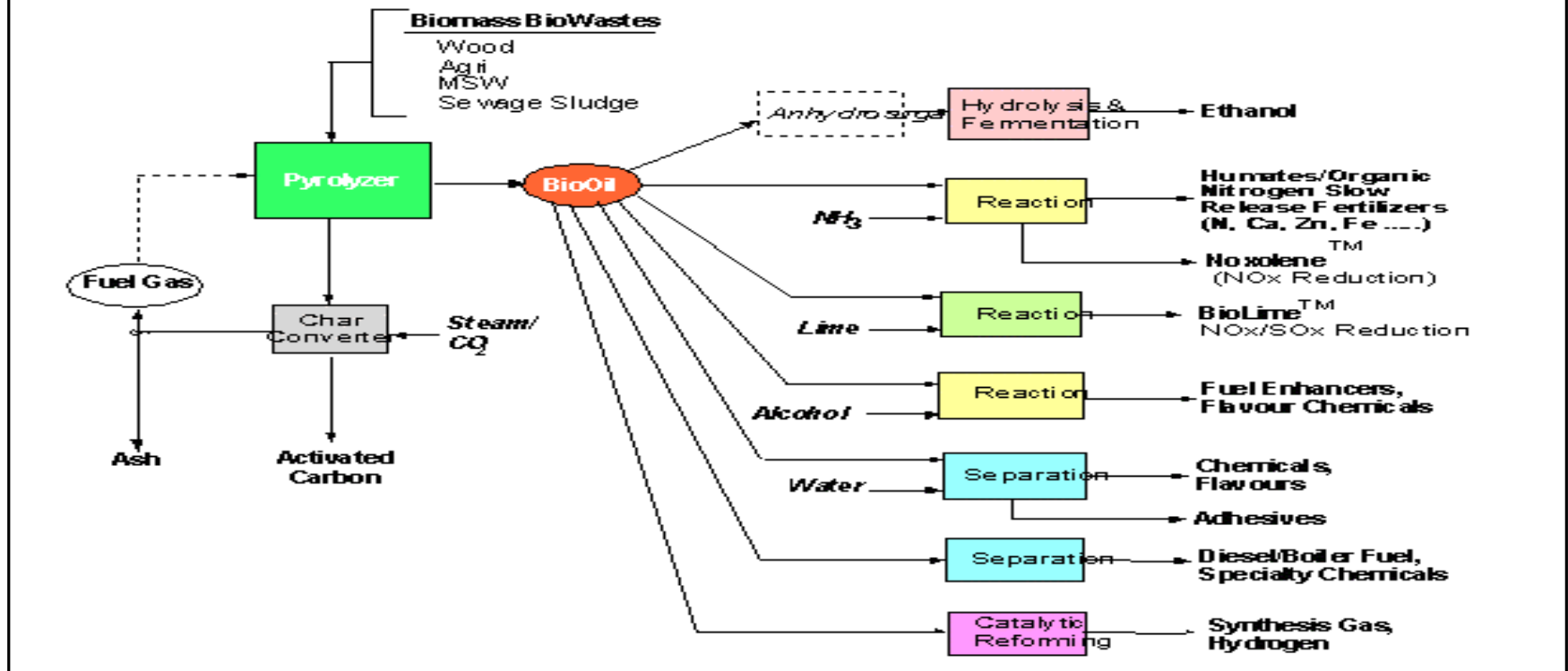
- Stand Alone (least complex)
- Integrated (improved efficiency)

Applications:

- Coupled (best economy)
 - De-Coupled (high flexibility)
-



DynaMotive / RTI Biomass Refinery Concept

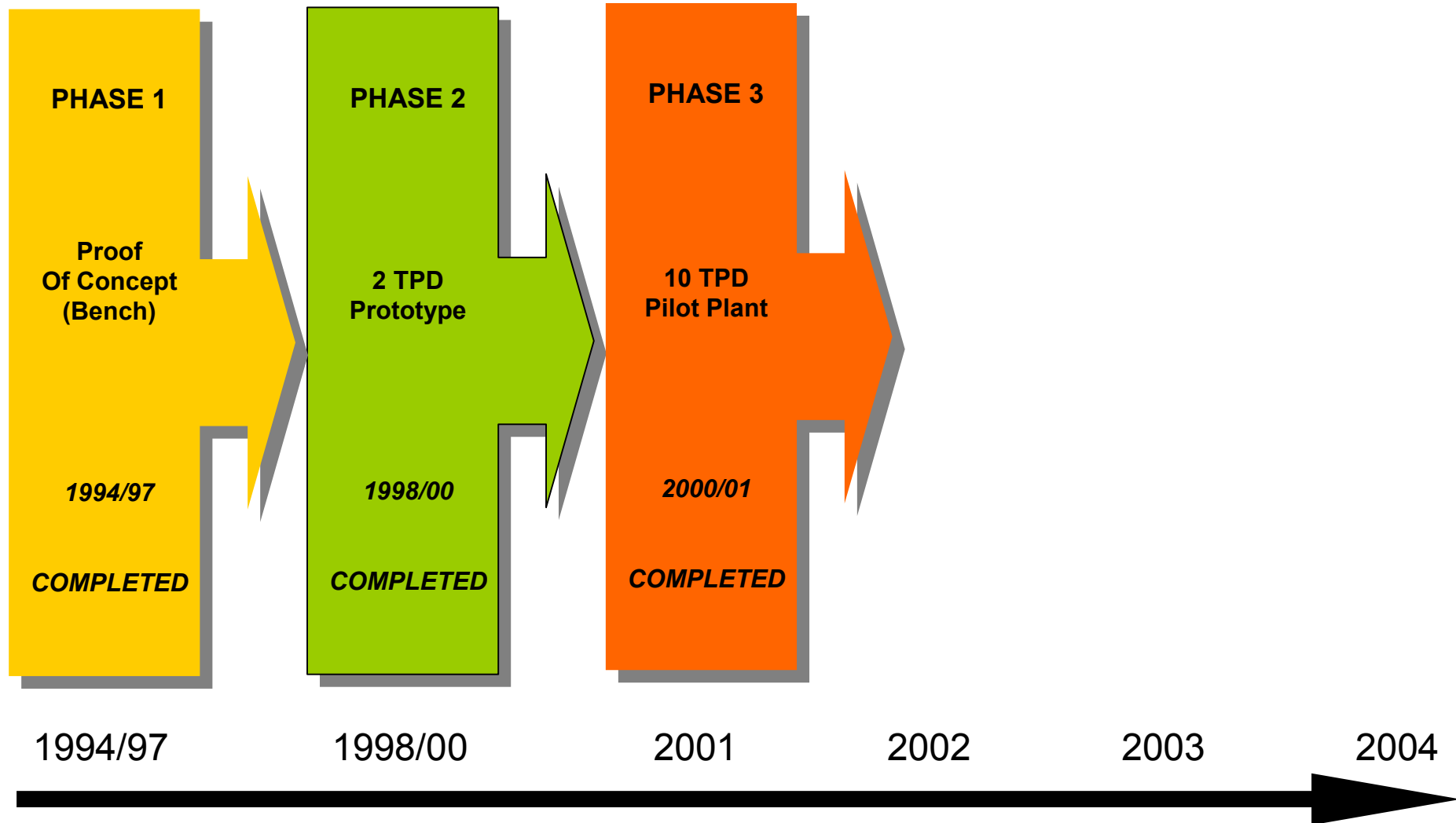


Critical Precursor:
Reliable High Quality BioOil Supply



Strategy:

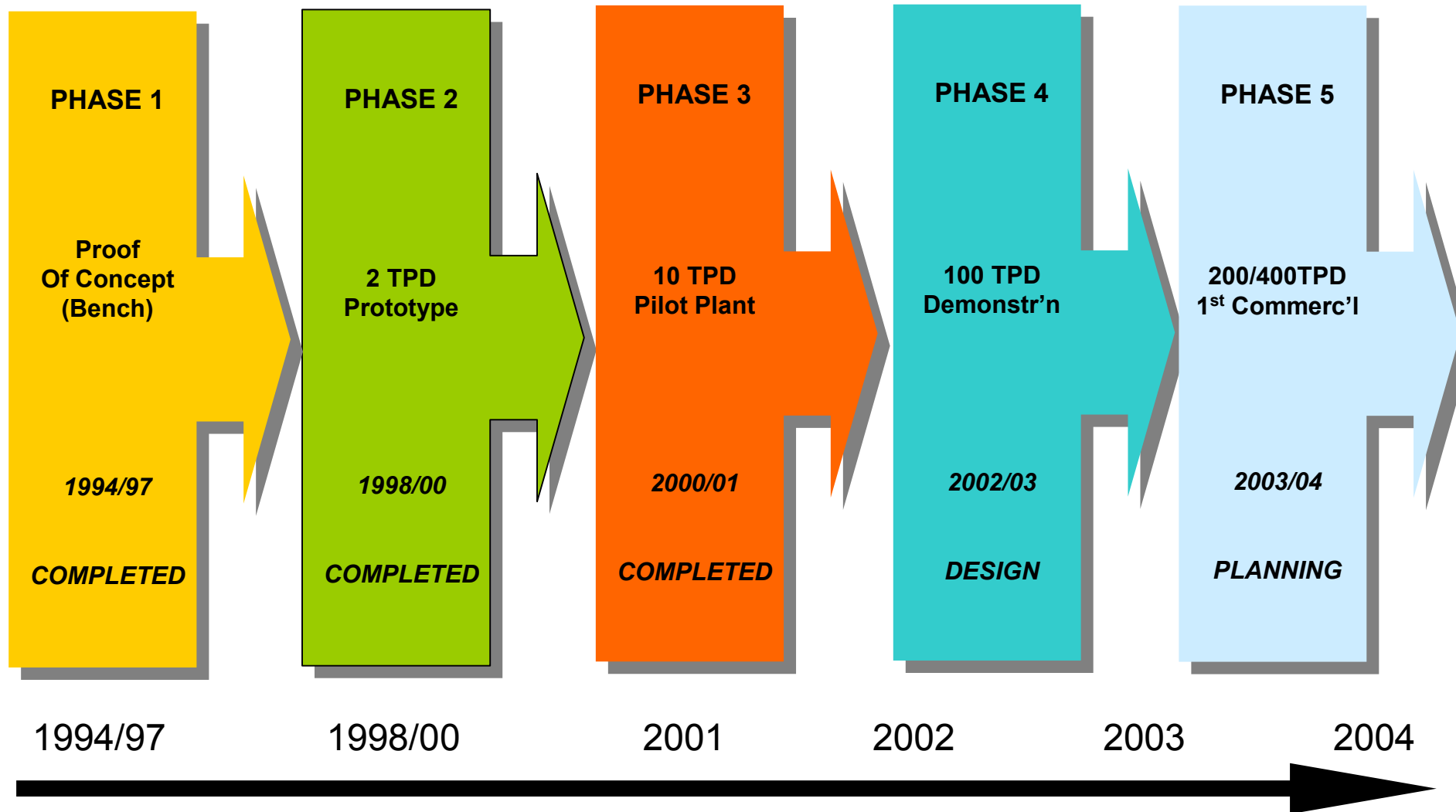
- Technology Development
 - Applications
 - Markets
-

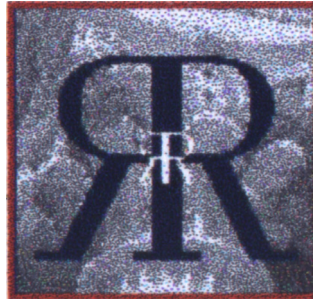


DYNAMOTIVE

10 Tonne Per Day Pilot Plant







- Gas Turbines (Orenda)
 - Slow/Med Speed Diesels (Discussions)
 - Direct Fired Applications
 - Burner Nozzle Development (NRCan)
 - Lumber Dry Kilns (Canfor, Megatherm)
 - Pulp Mill Lime Kilns (UBC, PTTel, Canfor)
 - BioOil Co-Firing with Fossils (TBD)
-

- Blends / Emulsions (NRCan, Univ. of Florence)
 - Synthetic fuels / Upgrading (RTI)
 - Adhesives (Discussions)
 - Specialty Chemicals (RTI, DOE)
-

- Briquettes (Leading US Manufacturer)
 - Activated Carbon (RTI)
 - Direct Combustion (Various Burner Co's)
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Federal Government

- Technology Partnerships Canada
- Natural Resources Canada
- Industrial Research Assistance Program

BC Provincial Government

- Ethanol BC
- Ministry of Employment



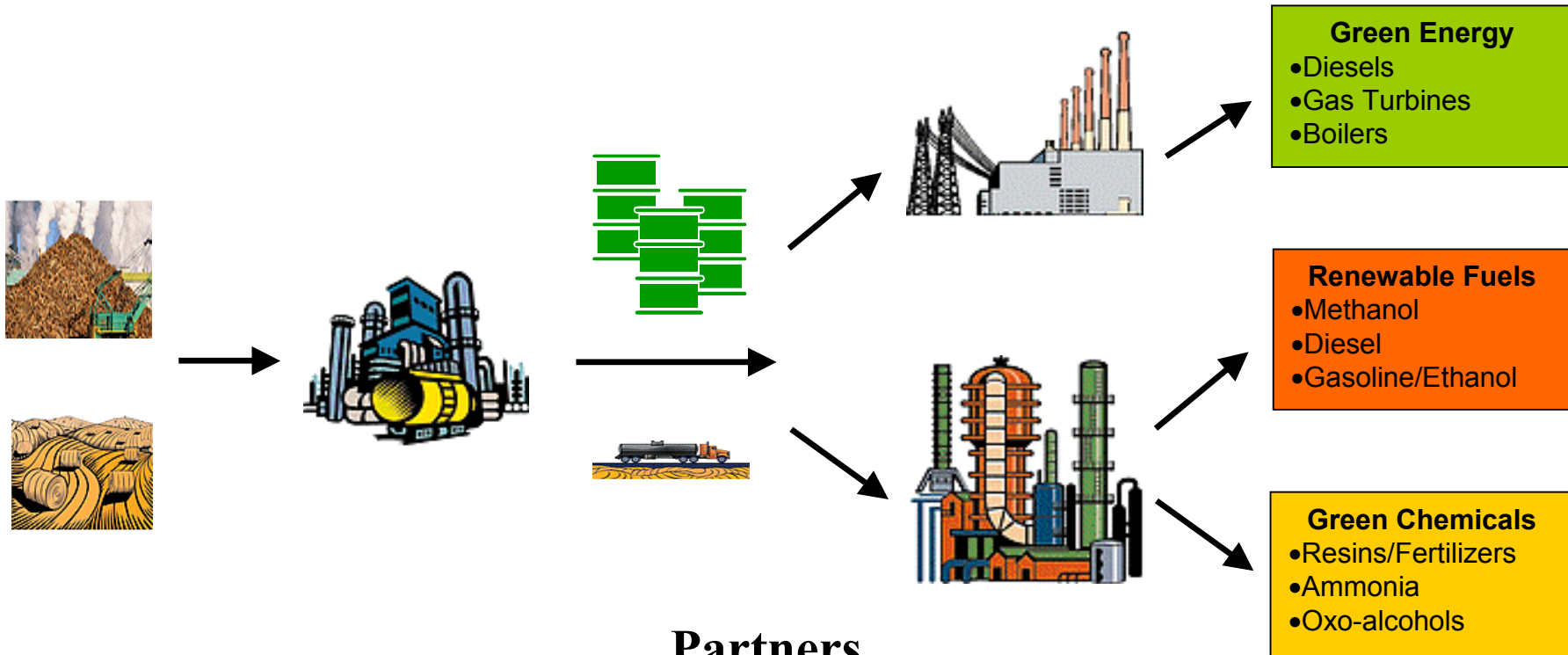
\$6 M

European Union

- UK Department of Trade and Industry
 - European Union THERMIE Grant
- } \$7 M

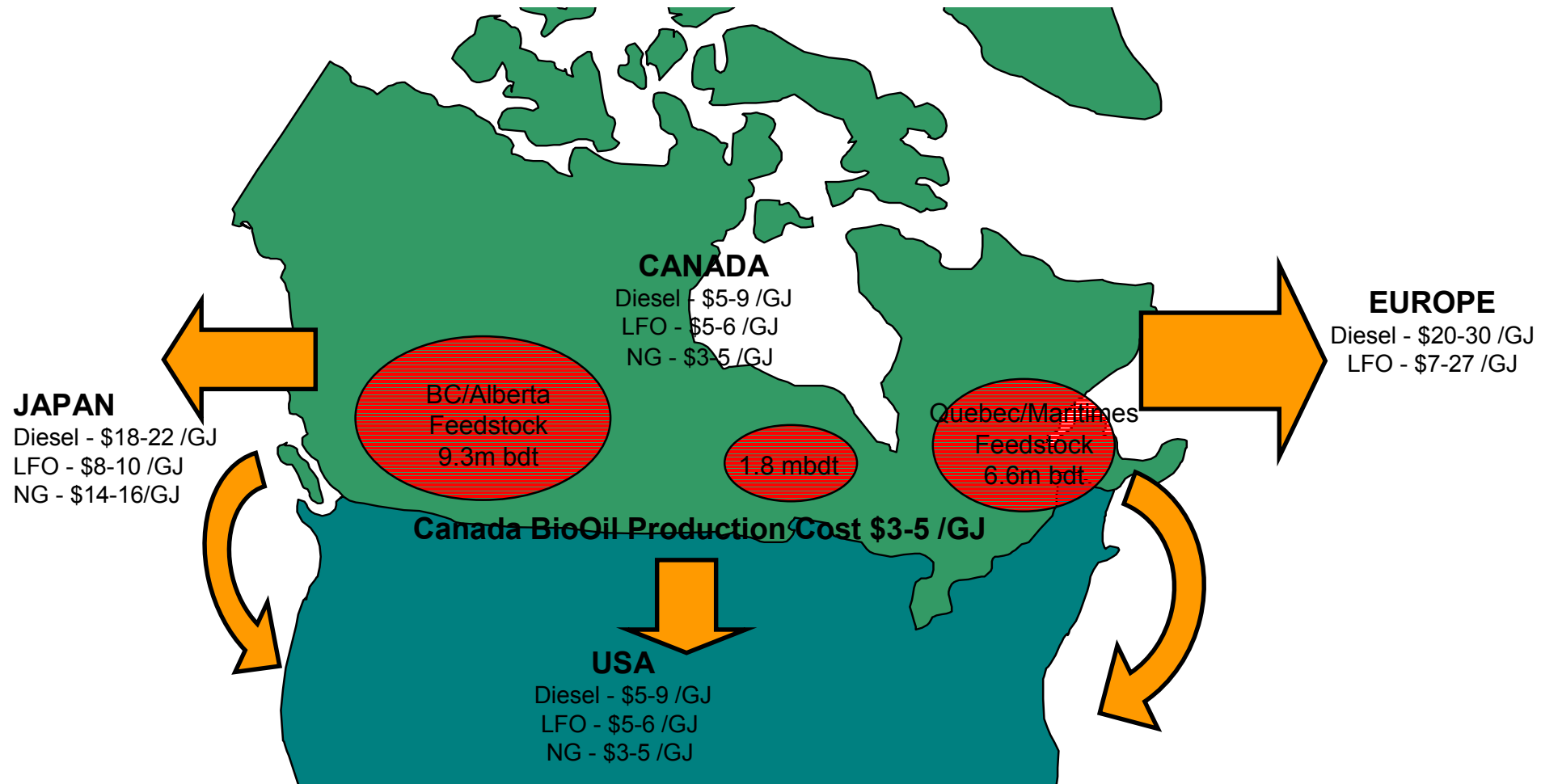
United States

- DOE (BioOil Power Gen. Paper Study) \$50k



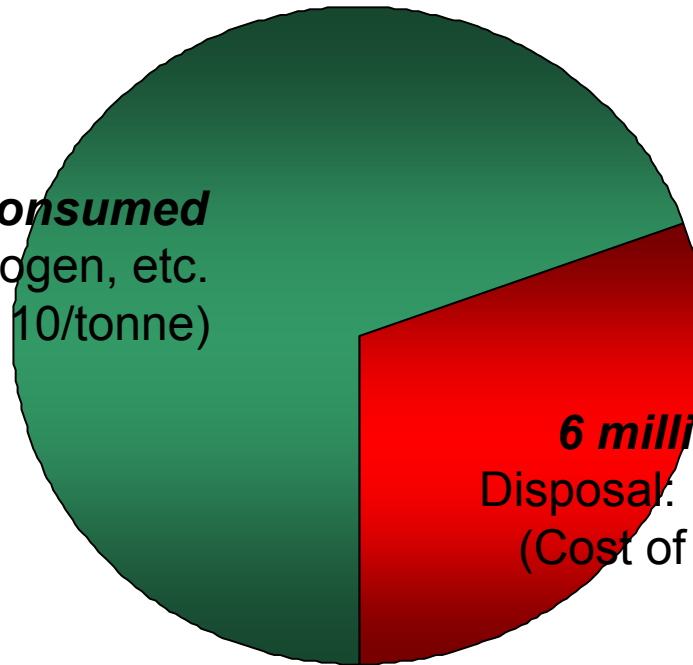
Canfor Cosan PTTel	DynaMotive Tecna UMA Bruks-Klockner	BC Rail Omni Trax	Orenda NRCan UBC	Forest Cos OPG Public Utilities
Rotch (Structured Financing)				





**Total Mill Residue Production:
18 million tonnes/year**

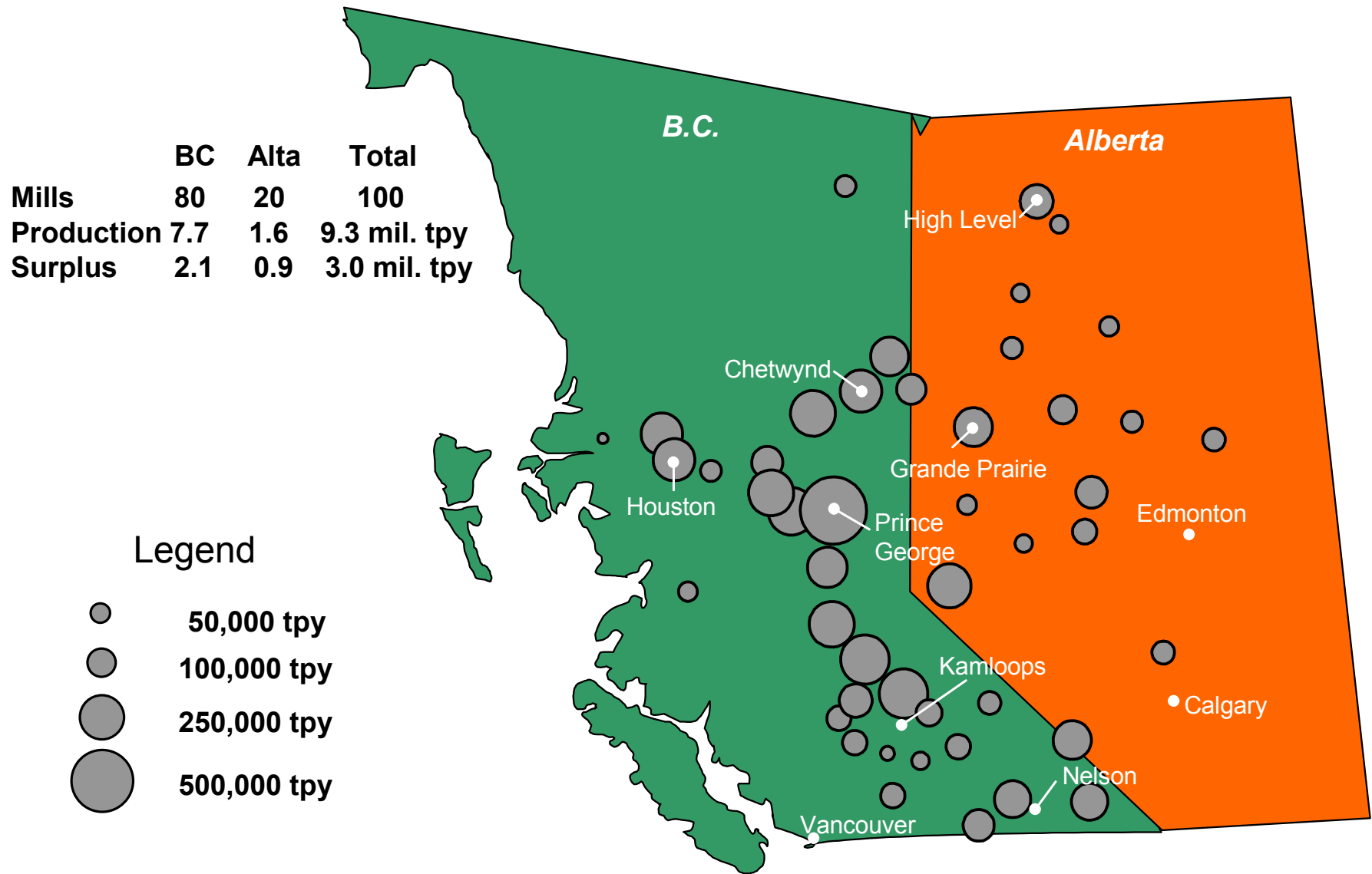
12 million tpy consumed
Markets: MDF, cogen, etc.
Value of US\$3 – 10/tonne)



6 million tpy surplus
Disposal: Incineration, landfill
(Cost of US\$ 3 – 6 /tonne)

Canada's Biomass Reserves

BC / Alberta Surplus Wood Residue



- Application: Substitute for NG in pulp mills/sawmills
 - Feedstock: Forest residue
 - Market Size: US \$ 200 - 320 M/yr (equiv. to 40 plants)
 - Value: US \$ 5 - 8 M/yr per plant
 - Initial Project: Canfor (Prince George) / 200 tpd Plant
-

- Application: BioOil fuelled green electricity
 - Feedstock: Energy crops and forest residues
 - Market Size: Contracted 69 MW BioOil Focused PPA's
 - Value: NFFO PPA revenue \$ 800 M (15 years)
 - Initial Project: 100 tpd BioOil plant and 2.5MW gas turbine
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DYNAMOTIVE

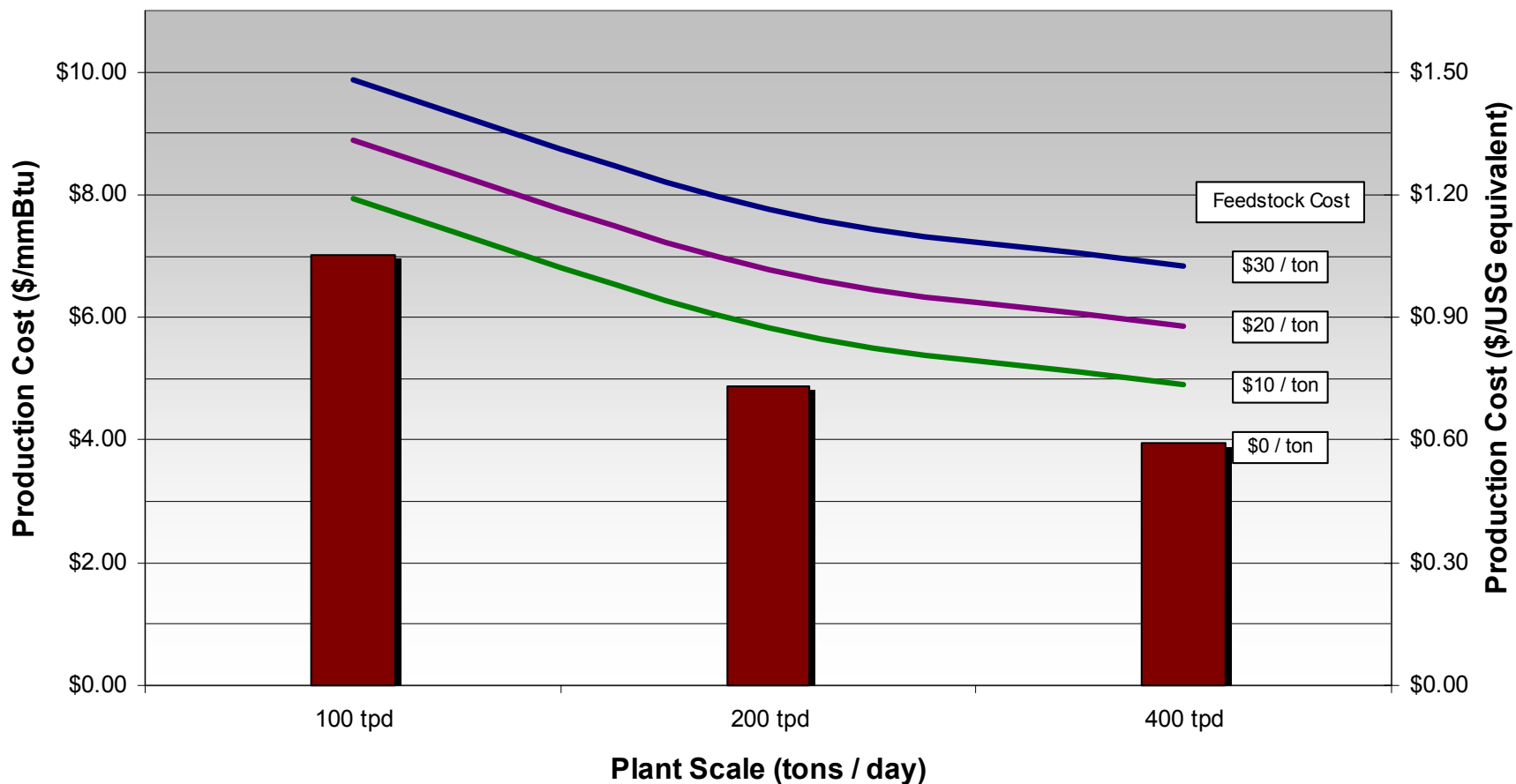
Green Fuels to the World



DynaMotive revenues from:

- Licensing Fees
 - Royalty Streams
 - Engineering Services
-

- Facility Scale 400 tons / day
 - Energy Production 1.6 million MBTU /yr
 - GHG Credit Potential 80,000 tons CO₂e /yr
 - Feedstock Required 135,000 dry tons /yr
 - Capital Cost \$11 - \$13 million
 - Employment 20 - 25 direct
20 - 30 indirect
-

BioOil Production Cost vs. Plant Scale and Feedstock Cost

- All capital and operating costs including 20% ROI
- Excludes char revenue offset (5 – 8 cents/USG)

DYNAMOTIVE

Green Fuels to the World



- Energy security (Nationally / State / Company)
 - Ecologically sound renewable energy supply
 - Value from low/negative cost feedstocks
 - Creation of a new industry (new employment)
 - Community development / diversification
-



- Level Playing Field (Taxes, Legislation)
 - Market Validation Programs
 - Industry Association
 - R&D Funding
 - “Gap” Funding
-

DYNAMOTIVE

Green Fuels to the World

